© KRALgroup - N_a 20120607 - NOVA 80 MID (1MTOEC80T001)

NOVA 80 MID

80A three phase energy meter, 4-quadrants with MID verification

with changes valid to: 07.06.2012
Features and specifications are subject to change.

USER MANUAL

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WARNING!

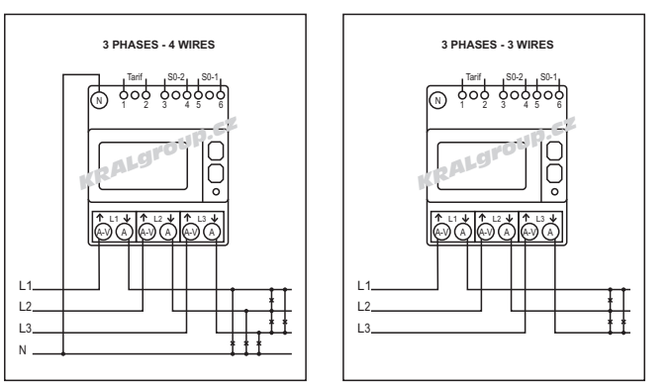
Device installation and use must be carried out only by qualified staff.
Switch off the voltage before device installation.
The content and the technical specification of this User Manual are subject to change without prior notice. They do not represent any contractual obligation.
KEEP THIS INSTRUCTION MANUAL - CONTAINS, I.A., EU-DECLARATION OF CONFORMITY

AVAILABLE MODELS

Model	Voltage	Frequency	MID certified
NOVA 80 MID - 3L	3x400 V	50Hz	▪
NOVA 80 MID - 4L	3x230/400 V		▪

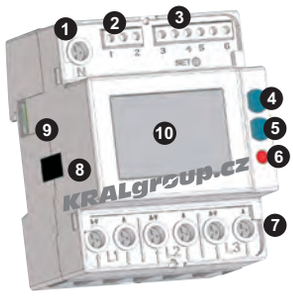
In all device models, partial counters are resettable.

WIRING DIAGRAMS

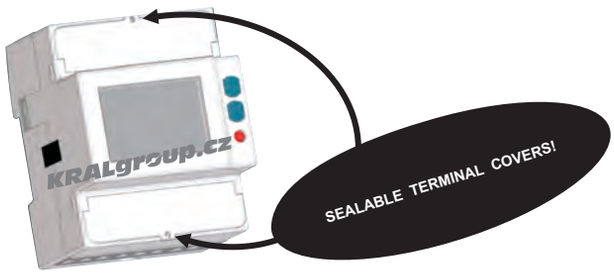


The meter works properly even if only one phase is connected. In this wiring the backlight is disabled for energy saving reasons.

OVERVIEW



1. Neutral terminal for 4 wire models
2. Tariff input terminals
3. Terminals for the two S0 outputs
4. UP key
5. ENTER key
6. Metrological LED
7. Current and voltage terminals
8. Safety-sealing (DO NOT REMOVE)
9. Optical COM port
10. Backlight LCD display



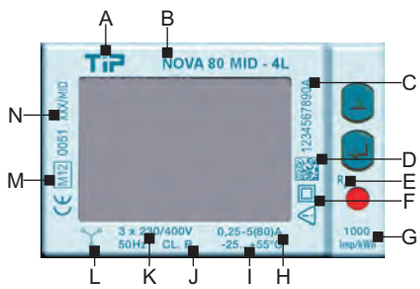
SYMBOLS ON FRONT PANEL (EXAMPLE)

A. Company logo
B. Device name
C. Serial number
D. Data Matrix
E. Metrological LED symbol
F. Protection class
G. Meter constant (Metrological LED)
H. Base current (max current)
I. Working temperature
J. Accuracy class
K. Nominal voltage/frequency
L. Wiring type

=3phase 4 wires,

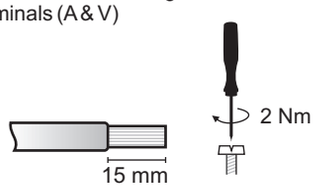
= 3phase 3 wires

M. MID approval symbols
N. Type approval certification



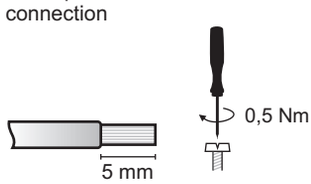
CABLE STRIPPING LENGTH

Connection measuring terminals (A & V)



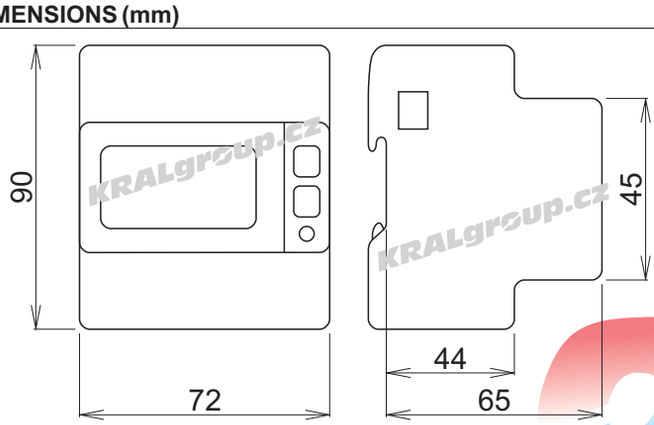
Use a PZ2 screwdriver.

S0 output / tariff terminals connection



Use a blade screwdriver with 0.8x3.5 mm size.

DIMENSIONS (mm)



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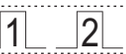
SYMBOLS ON DISPLAY

Display test can be carried out by pressing for 10 s ↵ and ▲simultaneously.

SYMBOL	DESCRIPTION
	Correct phase sequence (123)
	Wrong phase sequence (132)
	Undefined phase sequence (i.e. one or two phases are missing)
Σ	System value
L1 L2 L3	Value phase number
ERR	Metrological parameters corrupted (Code: XX will be displayed in the main area). The counter cannot be used and it must be returned to the Manufacturer.
	Active S0 output number
	Delivered (→), supplied (←) power or energy value
88888	Identify the Setup page (SETUP) or the Info page (INFO)
COM	Communication ON status
	SETUP page
	Capacitive / inductive value
-8888888	Main area
BAL	Balance counter value
PAR	Partial counter value. If flashing, the counter is stopped.
T1 T2	1 or 2 tariff counter value
MkVAhMkWhMkvarh	Measuring unit area

KEY FUNCTIONS

HOW TO	WHERE	KEY	PRESS TIME
Scroll loops	Any page except for Setup	↵	Instanta-neous
Access Setup pages	"Setup?" page	↵	>3 s
Confirm a value/digit	Setup pages	↵	Instanta-neous
Exit Setup pages	Setup pages	↵	>3 s
Scroll pages in a loop	Any loops page	▲	Instanta-neous
Change a value/digit	Setup pages	▲	Instanta-neous
Start/stop the displayed partial counter	Partial counters pages	▲ + ↵	Instanta-neous
Reset the displayed partial counter value	Partial counters pages	▲ + ↵	>3 s
Display test	Any page except for Setup	▲ + ↵	>10 s

MEASUREMENTS

	SYMBOL	MEASURE UNIT	DIS-PLAY	COM PORT	S0 OUTPUT
INSTANTANEOUS VALUES					
Voltage (Phase-0)	V_Σ - V_{L1-N} - V_{L2-N} - V_{L3-N}	V		●	
Line voltage (Phase-Phase)	V_{L1-L2} - V_{L2-L3} - V_{L3-L1}	V		●	
Current	I_Σ - I_1 - I_2 - I_3 - I_N	A		■	
Power factor	PF_Σ - PF_{L1} - PF_{L2} - PF_{L3}			●	
Apparent power	S_Σ - S_{L1} - S_{L2} - S_{L3}	kVA	■	■	
Active power	P_Σ - P_{L1} - P_{L2} - P_{L3}	kW	■	■	
Reactive power	Q_Σ - Q_{L1} - Q_{L2} - Q_{L3}	kvar	■	■	
Frequency	f	Hz		●	
Phase sequence	CW/CCW		●	●	
Power direction	IMP/EXP (Supply/Delivery)		●	●	
RECORDED DATA					
Total active energy	Σ - L1 - L2 - L3	kWh	■	■	■ (Σ)
Total reactive energy ind. and cap.	Σ - L1 - L2 - L3	kvarh	■	■	■ (Σ)
Total apparent energy ind. and cap.	Σ - L1 - L2 - L3	kVAr	■	■	■ (Σ)
T1/T2 tariff energy	Σ	kWh, kvarh, kVAh	■	■	
Resettable partial energy counters	Σ	kWh, kvarh, kVAh	■	■	
Energy balance	Σ	kWh, kvarh, kVAh	■	■	

OTHER INFORMATION	SYMBOL	VALUE / STATUS	DIS-PLAY	COM PORT
Present tariff	T	1/2		●
Undervoltage/overvoltage	VOL, VUL	ON/OFF		●
Undercurrent / overcurrent	IOL, IUL	ON/OFF		●
Underfrequency/overfrequency	fOL, fUL	ON/OFF		●
Partial counters	PAR	START/STOP	●	●
Active communication	COM	ON/OFF	●	
Active S0 pulse	S0-1, S0-2	ON/OFF	●	
Error condition	ERR	01/02	●	●

LEGEND: ● = STANDARD ■ = BIDIRECTIONAL VALUE

All the system counters (Σ) programmable for S0 outputs are shown in "SO OUTPUT" column. It is not allowed to set the same counter for both outputs.

NOTE: in case of 3 wires model, phase-neutral voltages, neutral current, phase powers, phase power factors parameters and all phase counters are not available.

BALANCE COUNTER VALUES CALCULATION

BALANCE COUNTER	FORMULA
kWh	[→kWh T1] – [←kWh T1] + [→kWh T2] – [←kWh T2]
kVAh ind	[→kVAh ind T1] – [←kVAh ind T1] + [→kVAh ind T2] – [←kVAh ind T2]
kVAh cap	[→kVAh cap T1] – [←kVAh cap T1] + [→kVAh cap T2] – [←kVAh cap T2]
kvarh ind	[→kvarh ind T1] – [←kvarh ind T1] + [→kvarh ind T2] – [←kvarh ind T2]
kvarh cap	[→kvarh cap T1] – [←kvarh cap T1] + [→kvarh cap T2] – [←kvarh cap T2]

METROLOGICAL LED AND PULSES ON S0 OUTPUT

METROLOGICAL LED PULSES	S0 PULSES
1000 Imp./kWh	100 Imp./kWh & Imp./kvarh & Imp./kVAh

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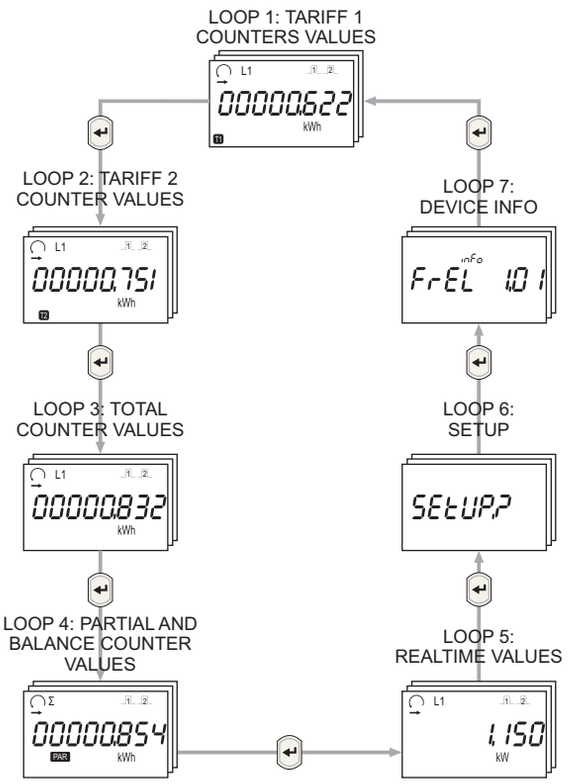
PAGE STRUCTURE

Device pages are grouped in 7 loops. Press ▲ to scroll pages in a loop.

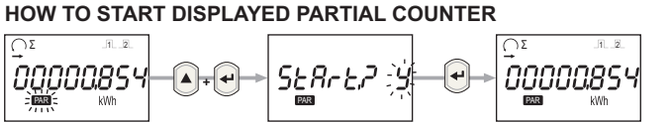


NOTE: in case of 3 wires model, pages showing phase values are not available.

HOW TO START / STOP / RESET PARTIAL COUNTERS

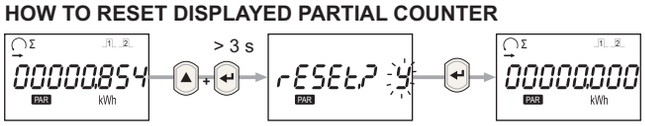
Feature available only on partial counter pages.

HOW TO START DISPLAYED PARTIAL COUNTER



HOW TO STOP DISPLAYED PARTIAL COUNTER PREVIOUSLY STARTED

HOW TO RESET DISPLAYED PARTIAL COUNTER



In **START?**, **STOP?**, **RESET?**, pages, selectable items are: **Y**=to confirm, **N**=to cancel. To change item, press ▲.

SETUP PAGES

SETUP ACCESS PAGE

>3 s

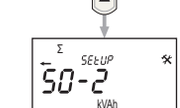
MODBUS ADDRESS (01...F7 Hex)
Available only in case of combined RS485 module
1. Press ⊖, the first digit will start to flash.
2. Press ⊕ to change the value.
3. Confirm with ⊖.
4. Repeat points 2 and 3 for the next digit.

MBUS PRIMARY ADDRESS (0...250)
Available only in case of combined MBUS module
1. Press ⊖, the first digit will start to flash.
2. Press ⊕ to change the value.
3. Confirm with ⊖.
4. Repeat points 2 and 3 for the next digit.

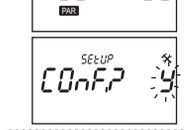
MBUS SECONDARY ADDRESS (0...99999999)
Available only in case of combined MBUS module
1. Press ⊖, the first digit will start to flash.
2. Press ⊕ to change the value.
3. Confirm with ⊖.
4. Repeat points 2 and 3 for the next digit.

MODBUS MODE (RTU=8N1, ASCII=7E2)
Available only in case of combined RS485 module
1. Press ⊖, the item will start to flash.
2. Press ⊕ to change the item.
3. Confirm with ⊖.

COMMUNICATION SPEED
Page and range available according to the combined communication module
1. Press ⊖, the value will start to flash.
2. Press ⊕ to change the value.
3. Confirm with ⊖.



COUNTER ASSIGNED TO S0 OUTPUT (1-2)
1. Press ⊖, the items which identify the counter (e.g. →, kWh) will start to flash.
2. Press ⊕ to change the counter to be assigned to the output.
3. Confirm with ⊖.



ALL PARTIAL COUNTERS RESET
1. Press ⊖, a new page for confirmation will be displayed.
2. Press ⊕ to change the flashing value, **Y** to confirm the reset, **N** to cancel.
3. Confirm with ⊖.

>3 s

ON ANYSETUP PAGE

EXIT FROM SETUP
1. Press ⊕ to change the flashing value, **Y** to exit and save the settings, **N** to exit without saving, **C** to continue scrolling setup first page.
2. Confirm with ⊖.

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INFO PAGES

Up to 4 INFO pages can be displayed to show details about:

1. counter firmware version
2. checksum
3. combined communication module in use
4. full scale value (FSA)

The third page, which shows communication module in use, can change according to the module combined with the counter (see table). If the counter has no combined module this page will not be displayed.

COMBINED COMMUNICATION MODULE	DETAIL DISPLAYED ON THE INFO PAGE
RS485 MODBUS	Modbus
M-BUS	Mbus
LAN GATEWAY	Lan
EIB/KNX i.V	(no info - in preparation)

TECHNICAL FEATURES

Data are in compliance with standards	EN50470-1, EN 50470-3, EN 62053-23, EN 62053-31		
GENERAL			
Housing in compliance with standard	DIN 43880		
Terminals in compliance with standard	EN 60999		
AUXILIARY POWER SUPPLY			
Power supplied from the voltage circuit	-		
Nominal measurement voltage	±20%		
Consumption (for each phase)	7,5 VA max.		
Nominal frequency	50 Hz		
VOLTAGE/FREQUENCY AND WIRING MODES			
MODEL	**WIRING**	**V**	**f**
NOVA 80 MID - 3L	3 phases 3 wires	3x400 V	50 Hz
NOVA 80 MID - 4L	3 phases 4 wires	3x230/400 V	
CURRENT (A)			
Maximum current I_{max}	80 A		
Basic current I_{ref} (I_b)	5 A		
Ratio current I_{tr}	500 mA		
Minimum current I_{min}	250 mA		
Starting current I_{st}	20 mA		
ACCURACY			
Active energy class B according to	EN 50470-3		
Reactive energy class A according to	EN 62053-23		
2 S0 OUTPUTS			
Passive optoisolated	-		
Maximum values (in compliance with EN 62053-31)	250 VAC-DC - 100 mA		
Pulse length	50 ±2ms ON time min. 30 ±2ms OFF time		
TARIFF INPUT			
Active optoisolated	-		
Min.-max. voltage	80...276 V(AC-DC)		
METROLOGICAL LED			
Meter constant	1000 Imp./kWh		
WIRE DIAMETER FOR TERMINALS			
Measuring terminals (A & V)	1,5...35 mm²		
S0 output / tariff terminals	0,14...2,5 mm²		
SAFETY ACCORDING TO EN 50470-1 STANDARD			
Indoor installation	-		
Pollution degree	2		
Protective class (EN 50470-1)	II		
Pulse voltage test	1,2/50µs 6kV		
AC voltage test (EN 50470-3, 7.2)	4 kV		
Housing material flame resistance	UL 94 class V0		

ENVIRONMENTAL CONDITIONS	
Mechanical environmental	M1
Electromagnetic environmental	E2
Operating temperature	-25°C ... +55°C
Storage temperature	-25°C ... +75°C
Relative humidity (without condensation)	max. 80%
Sinusoidal vibration amplitude	50 Hz ±0,075 mm
Protection degree - frontal part (granted only in case of installation in a cabinet with at least IP51 protection degree)	IP 51
Protection degree - terminals	IP 20

WASTE DISPOSAL

This product may not be, at the end of its useful life, disposed of with normal household waste but must be returned to a collection point for recycling of electronic equipment. Please check with your dealer or local authorities for disposal of the competent authority.

EU-DECLARATION OF CONFORMITY

Product name: **THREE-PHASE STATIC WATT-HOUR METER OF ACTIVE ENERGY**

Type designation: **NOVA 80 MID - 4L**
NOVA 80 MID - 3L

EC-Type test certificate: **154/MID** (NOVA 80 MID - 4L)
155/MID (NOVA 80 MID - 3L)

Number and address of notified person:
(Modul B+D) 0051
IMQ SpA
Via Quintiliano 43
I-20138 MILANO

Metrology marking: **CЄ-M13-0051**

The watt-hour meters NOVA 80 MID - 4L and NOVA 80 MID - 3L meet the requirements of EN50470-1, EN 50470-3, EN 62053-23, EN 62053-31 of both current direction of class B for active energy and of class A for reactive energy for direct connection into the three-phase electricity network.
Potential-free-pulse-transmitter complies with DIN EN 62053-31 standard for installation of broadcasting impulses for Class A and B for the transmitter of type "S0".
The kWh meter corresponds to a tariff metering in the way its connection to the three-phase electricity network.
The external dimensions of the meter corresponds to the built-in devices of a 4-modules (4-TE) size according to DIN 43880 standard.
Installation of the energy meters is designed for mounting on a standard DIN-rail 35 mm wide according to DIN EN 50022 standard.
The electric protection class of the energy meters with terminal covers corresponds to IP51 according to DIN EN 60529 standard.

Prague, 22.10.2013

KRALgroup
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Your partner for measuring the energy

DIN RAIL MOUNTED kWh METERS
RE/CONDITIONED kWh METER
PRE/PAZMENT kWh METERS
CREDIT CARDS kWh METERS
GSM OPERATED kWh METERS
SPECIAL kWh METERS
OTHERS FOR THE MEASUREMENT OF EL. ENERGY
CURRENT TRANSFORMERS
MEASURING POWER IN HARBORS AND ANCHORAGE SHIP (MARINAS)
MEASURING POWER IN THE CAMP, IN TRADE FAIR, EXHIBITION, BUSINESS, COMMERCIAL AND ADMINISTRATIVE CENTERS
ENERGY MANAGEMENT SYSTEMS (M-Bus, PLC, GSM, RS-485, EIB, INSTA-BUS)

Our advice is for You with pleasure

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